Couples perception regarding how lifestyle might affect fertility: results of a pilot study

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KEY WORDS

lifestyle, infertile, perception, healthy child, couples

ABSTRACT

Background
There is evidence that lifestyle behaviours can adversely affect general health and reproductive performance. Despite this evidence a substantial proportion of the Australian population continue to ignore the importance of a 'healthy lifestyle'.

Aim
This study aimed to examine the perceptions of infertile couples regarding the effect lifestyle might have on general and reproductive health.

Methods
Twenty new patients from an Adelaide fertility clinic were interviewed and asked a series of structured questions about their own lifestyle and whether they thought that various lifestyle factors might affect the chance of conceiving and a healthy pregnancy. They were also asked to rate the possible effect of other factors on the chance of conception, using a 10-point likert scale.

Results
Most couples thought smoking and being over or underweight would adversely affect the chance of conceiving and a healthy pregnancy. Couples also perceived that taking recreational drugs and psychological stress would adversely affect the chance of conception, but were not as convinced about the effects of other lifestyle factors such as alcohol and caffeine consumption. Although most were taking some type of over the counter supplement, only half of the females were taking folic acid. The majority of participants wanted to make changes to their lifestyle and common barriers included, insufficient time, difficulties in finding an enjoyable exercise and lack of motivation.

Conclusion
This study has highlighted that infertile couples are generally aware of the potential impact of some lifestyle behaviours on fertility. However, only half of the obese women in this sample considered their weight to be a risk factor to their own fertility and while most were taking over the counter supplements, half the females were not taking folic acid. There remains an obvious need to research and develop effective means of assisting couples to make 'healthier choices' that will improve their general health and well being and chances of conceiving and delivering a healthy child.

INTRODUCTION

Lifestyle behaviours have been shown to affect reproductive performance in both the infertile and general population. There is strong evidence that age, weight and smoking impact on general health and adversely on reproductive performance (Homan et al 2007). For example recent results from 36,412 first IVF cycles demonstrate a decline in live birth rates with increasing female age. For women aged 30 or over, each additional year in age was associated with a 13% (99% CI: 12–14%) reduction in the chance of a live delivery (Wang et al 2008). A large Australian study of 3,586 women who underwent Assisted Reproductive Technology (ART) treatment found pregnancy rates were halved for very obese women in comparison with women with a normal BMI (Wang et al 2000) and a study of 2,112 pregnant women found those women with a BMI of >25 or <19 had a relative risk of time to conception of >12 months of 2.2 (95%CI 1.6–3.2, P<0.0001) (Hassan and Killick 2004). Several other lifestyle factors such as psychological stress, caffeine consumption, alcohol consumption and exposure to environmental pollutants have also been implicated although the evidence is equivocal (Homan et al 2007). Folate plays a crucial role in the development of the central nervous system and numerous studies have confirmed the importance of adequate folate prior to conception and in early pregnancy (McDonald et al 2003).

However, despite this evidence people continue to ignore the importance of healthy lifestyle choices. The lifestyle of a substantial proportion of the Australian population may be adversely affecting their general and reproductive health. For example the prevalence of overweight and obesity has more than doubled in the past 20 years with 60% of the Australian population being overweight or obese (Cameron et al 2003) and 70% of those aged over 15 years are reported to have sedentary or low exercise levels (ABS 2004-2005a). There is a trend for women to delay childbirth most likely due to social reasons such as establishing their career or not having found a suitable partner and although current figures show the prevalence of smoking has decreased, 23% of adults are still smokers (ABS 2004-2005b).

Risk factors for individuals extend to couples because the lifestyle of both partners contributes to reproductive health and delivering a healthy baby. How aware infertile couples are of the importance of lifestyle factors is largely unknown. The aim of this study was to pilot a questionnaire to examine the extent to which couples perceived the effect lifestyle might have on general and reproductive health and to examine the suitability of conducting couple interviews focussed on lifestyle and fertility.

MATERIALS AND METHODS

Couples attending an Adelaide based fertility clinic were recruited to the study and ethics approval was granted by the Children, Youth and Women's Health Service Human Research Ethics Committee. The couples were all new patients and approached after booking their first visit to the clinic and invited to participate. They were given an envelope containing an introductory letter, an information sheet explaining the study and a consent form. They were followed up two weeks later with a phone call asking if they wished to participate. For those couples who agreed to take part in the study, an interview time was organised either at the clinic or in their own home. A consent form was signed prior to the interview. Interviews (couples) were conducted by a single researcher (GH) and took half an hour to an hour to complete. Each partner (male and female) were asked a series of structured questions regarding their lifestyle and whether they thought that various lifestyle factors might impact on the chance of becoming pregnant or on the health of a pregnancy (Appendix 1). The questions were developed with the aim of encouraging participants to answer according to their own individual perception of certain lifestyle factors and how they might impact on their health and fertility. Specific definitions of lifestyle factors were therefore not provided. Participants' responses were recorded in writing and taped, which allowed the interviewer to concentrate on what they were saying and review the tape following the interview. Tapes were listened to in detail and information abstracted from them.

The questions consisted of three sections. The first comprised of fourteen items related to smoking and weight and whether couples though they might impact on the chance of conception and a healthy pregnancy. The second section comprised of seven items relating to the possible impact of recreational drugs, psychological stress, alcohol, caffeine, diet, exercise and taking over the counter supplements. Each factor in this section was rated using a 10-point likert scale, on how participants perceived they might influence the chance of becoming pregnant (1=not influential, 2-4=slightly influential, 5-7=moderately influential, 8-10=highly influential). The third section comprised of two items related to making lifestyle changes.

Responses to the questions were analysed using a combination of qualitative and quantitative methods, which is an effective way of providing a flexible approach to a complex research question (Andrew and Halcomb 2006). Descriptive aspects were compiled with the aid of Microsoft Excel. Qualitative data was analysed using thematic analysis, a recognised qualitative method (Aronson 1994) that demonstrates rigour and reflects the depth of the data.

RESULTS

Sixteen couples were invited to participate and ten agreed to be interviewed. All couples were male and female partnerships. The most common reasons for non participation was difficulty in finding a time when both partners could be present (four couples). The demographic characteristics of couples are described in table 1.

Table 1: Demographics

Couple	Age M	Age F	Infertility Diagnosis	Children	Duration of infertility (number of years attempting pregnancy)	Education
1	38	37	Ovulatory disorder	0	2	M= D F=D
2	39	42	Low ovarian reserve	1 (+1 m/c)	3	M=D F=Y12
3	45	42	Semen factor, low ovarian reserve	0	1	M=D F=Y12
4	28	30	Ovulatory disorder	1	1	M=D F=D
5	37	35	Unexplained	0	10	M=Y12 F=D
6	39	36	Semen defect	0	3	M=Y12 F=Y12
7	32	29	Semen defect	0	1	M=D F=Y12
8	41	41	Low ovarian reserve	0	1	M=D F=Y12
9	25	23	Ovulatory disorder	0	2	M= <Y12 F= <Y12
10	47	47	Low ovarian reserve, ovulatory disorder	0	2	M=D F=D

Education: D = Degree, Y12= Year 12, < Y12= less than year 12

Smoking

When asked about past and present smoking habits, only one couple reported that they were current smokers (table 2).Although 70% of males and 90% of females thought smoking was either likely to or would adversely affect the chance of conception,

one couple thought it would not and two males were unsure. Common reasons given for a detrimental effect included: smoking is generally bad for you, smoking negatively affects the blood flow and oxygen levels in the body, it is a toxin and smoking can damage sperm and alter a woman's hormones.

Most males and females thought that smoking was likely to or would adversely affect a pregnancy, with only one male and one female stating that they were unsure (table 2). The problems described included: smoking causes low birth rate, increases the chance of birth defects, the baby may have underdeveloped lungs and be more susceptible to Sudden Infant Death Syndrome.

Table 2: Perceived effects of smoking and weight

Smoking	Male (N=10)	Female (N=10)
Current smoker	1	1
Past smoker	1	5
Adversely affect chance of pregnancy	7	9
Adversely affect pregnancy	9	8
Weight	**Male (N=10)**	**Female (N=10)**
Perceived to be overweight	6	6
High BMI >30	3	4
Adversely affect chance of pregnancy	7	10
Adversely affect pregnancy	7	9
Weight relevant to our infertility	2	2

Weight

When asked whether they considered themselves over or underweight, six males and six females said that they were overweight (table 2). Using the usual definition of abnormal weight, a body mass index (BMI kg/m2) of ≥ 25 or < 20, three of these males had a high BMI and four females had a high BMI. The remaining five who considered themselves overweight were within the normal range.

The rest of the sample recognised they were within the normal weight range.

In relation to whether being over or underweight might adversely affect the chance of conception, all females and 70% of males thought that it would. While four couples were unsure why, the most common reasons given were: excess weight affects a woman's hormones, being undernourished can disrupt the menstrual cycle and the body doesn't function properly if either over or under weight. When asked if weight would adversely affect a pregnancy, 90% of females and 70% of males thought that it would. Again four couples were unsure why and the most common reason given was lack of nourishment for the baby particularly if the mother was underweight. Only one female referred to pregnancy complications such as gestational diabetes and hypertension.

Although all the females with a high BMI said that this could affect the likelihood of conception, only two thought it was problematic to their own chance of becoming pregnant. However, they all wanted to lose weight and reported that the biggest problem in doing so was insufficient time to plan and prepare proper meals and exercise and not being sufficiently organised.

Other lifestyle factors

Most participants thought that taking recreational drugs would negatively affect the chance of becoming pregnant, with 17 out of 20 rating it as highly influential (table 3). The most common reason described was that drugs are 'toxic'. Psychological stress was also perceived by most to have a negative affect on fertility, with 14 out of 20 participants rating it as highly influential. Four males said stress was problematic because it affected sexual performance and 70% of couples said the whole body is affected by stress. Two men and four women were currently feeling stressed and two women said they often felt stressed.

More than half of the participants said that alcohol consumption at any level would be highly influential to the chance of pregnancy and one couple though it was only a problem if consumed daily. Reasons given included: a 'gut feeling', alcohol is a toxin, alcohol reduces sexual performance and the advertising regarding no alcohol in pregnancy 'set off alarm bells'. Most participants did not drink alcohol at all, or drank in small quantities (occasionally or one-three times a week).

Table 3 Perception of lifestyle factors (recreational drugs, psychological stress, alcohol, caffeine, diet, exercise, vitamins) on chance of conception

Factor	Male (N=10)		Female N=10)		Why?
Recreational Drugs	Highly influential	N=9	Highly influential	N=8	Toxic
	Moderately influential	N=1	Moderately influential	N=2	
Psychological stress	Highly influential	N=7	Highly influential	N=7	Decreased male sexual performance
	Moderately influential	N=3	Moderately influential	N=3	Affects general health
Alcohol	Highly influential	N=6	Highly influential	N=6	Gut feeling
	Moderately influential	N=3	Moderately influential	N=2	Toxic
	Slightly influential	N=1	Slightly influential	N=2	Bad for general health Decreases sexual performance Only a problem in large quantities
Caffeine	Highly influential	N=5	Highly influential	N=3	Don't know
	Moderately influential	N=2	Moderately influential	N=3	Would need a lot to be a problem
	Slightly influential	N=3	Slightly influential	N=4	Affects sperm Dehydrating
Diet	Highly influential	N=5	Highly influential	N=4	Healthy diet is good for general health which may promote fertility
	Moderately influential	N=4	Moderately influential	N=5	Secondary effect i.e. bad diet promotes obesity
	Slightly influential	N=1	Slightly influential	N=1	
Exercise	Highly influential	N=1	Highly influential	N=5	Good for general health which may promote fertility
	Moderately influential	N= 7	Moderately influential	N=5	Endocrine system works more efficiently
	Slightly influential	N=2			
Vitamins	Highly influential	N=3	Highly influential	N=4	Not necessary if eating a healthy diet
	Moderately influential	N=4	Moderately influential	N=2	Difficult to eat a healthy diet because of preservatives and additives
	Slightly influential	N=3	Slightly influential	N=4	No strict regulations associated with over the counter supplements

Eight participants considered caffeine consumption highly influential and seven thought it would only be slightly influential to the chance of getting pregnant. Reasons given as to why it could have a negative effect included: caffeine might alter how the sperm move and caffeine is dehydrating. Most participants drank low to moderate amounts of one-two cups of coffee, tea or cola per day.

Most couples thought that eating a healthy diet could improve fertility, because this would promote general good health. Reasons given included: conception is a complex event therefore good nutrition must be beneficial, the body works better when fuelled with a healthy balanced diet. One couple thought that an unhealthy diet would only be a problem because of the secondary effect of promoting obesity. All but two participants said they ate a healthy diet, although take away food was eaten regularly once a week by most.

Most couples thought that taking regular exercise and therefore being physically fit generally promoted a healthy body, which could improve an individual's fertility. However, some couples emphasised that unfit people frequently become pregnant. Only one participant (male) thought that the connection between fitness and fertility was specific, being related to promoting a better functioning endocrine system. Most males (nine) considered themselves to be physically fit and eight exercised on a regular basis. Most females (seven) also said they were fit and took regular exercise. Of the participants who said they were not fit, one exercised regularly and three took no exercise at all.

Although four couples said that it was not necessary to take additional over the counter supplements if eating a healthy diet, all but three (males) were currently taking some type of supplement. One couple was concerned there were no regulations associated with over the counter supplements. The supplements being taken included; folic acid (five females), multivitamins (four males, six females), herbs mixed by a naturopath (two females, one male), primrose oil (one female), Vitamin B (two females, one male), fish oil (one female, one male), glucosamine (one female), Ovulit (one female), horny goats weed (two males), zinc (one male), selenium (one male), horseradish (one male). Four couples said that taking supplementary vitamins were necessary, because it was difficult to eat a healthy diet due to the preservatives and additives that are applied to most foods bought in the shops.

The majority of participants wanted to make changes to their lifestyle (18 out of 20). These changes included; losing weight (two males, three females), eating better (two males, two females), reducing work hours (three males), exercising more (three males, four females), relaxing and reducing stress levels (one male, two females).

Barriers to making these changes included: insufficient time, difficulties in finding an enjoyable exercise, lack of motivation, prioritising what is important, lack of money, lack of willpower, being tired and needing a holiday. Of the five couples who said that insufficient time was the major barrier to them making lifestyle changes, either one or both partners spent long hours working and found it difficult to prioritise exercise and sensible healthy eating into their day. Three couples said that although they wanted to make changes they lacked the motivation and willpower to do so.

DISCUSSION

This was a pilot study to examine the suitability of conducting individualised couple interviews focused on lifestyle factors and fertility. While there is abundant evidence of the impact of lifestyle on healthy fertility (Homan et al 2007), couple awareness and perception of the importance of lifestyle factors in relation to their own situation has not been widely researched. A recent study surveyed students about their fertility knowledge and reported that both males and females were knowledgeable about risk factors for fertility (Bunting and Boivin 2008). However, the study did not ask about the students lifestyle and how they felt it may relate to them.

Being over or underweight has been shown to adversely affect the chance of conception and a healthy pregnancy (Rich-Edwards et al 1994; Norman et al 2004; Lintsen et al 2005) and most participants were aware of this. Responses to the questions regarding weight were paradoxical. Forty per cent of females were obese, they were all aware that they were significantly overweight, however only half of them considered that their weight was a factor in their own infertility.

Considering the strength of the evidence of adverse effects on conception associated with smoking (Bolumar et al 1996; Augood et al 1998; Klonoff-Cohen et al 2001), it is encouraging that smoking was perceived to be problematic to a pregnancy. Only one couple thought that smoking would not harm the chance of conception and two males were unsure. This is in contrast to Roth's study of 388 females, where they found that while risks of lung cancer, respiratory and heart disease and pregnancy complications associated with smoking were well known, women were not well informed about the potential fertility risks (Roth and Taylor 2001). There is a need for increased public education of fertility risks associated with smoking.

Recreational drugs such as marijuana have been implicated in infertility (Park et al 2004). The use of recreational drugs was widely recognised as a negative factor for health and fertility and none of this sample were present or past users.

Psychological stress is common amongst the infertile population (Cousineau and Domar 2007; Hammarberg et al 2001) and six participants in this sample were feeling stressed. Although inconsistent across studies there is evidence that stress may

affect female fertility and providing counselling and support has been shown to decrease the time taken to conceive (Terzioglu 2001; Domar et al 2000). The results of this study indicate that both men and women believe stress may impact on their fertility, but although counselling is available free of charge in the clinic none of these patients attended counselling. This is typical of the clinic from which this sample is drawn, where it appears as if only a minority of couples seeks psychological assistance.

Alcohol consumption has been associated with reduced fertility but it is unclear what level of alcohol is significant (Mukherjee et al 2005; Hakim et al 1998). Participants were concerned about the potential effects of alcohol consumption, with more than half of the sample indicating they thought alcohol would adversely affect the chance of conceiving. This belief was reflected in their actions, with most drinking only small amounts of alcohol or not at all. In South Australia the risks of alcohol consumption during pregnancy are well publicised (Womens and Childrens 2004) and other adverse effects associated with heavy drinking are also widely recognised (Zhang et al 2007; Ripabelli et al 2006; Anonomyous 2001), so recognition of a connection between alcohol and fertility could be expected.

The consumption of caffeine has been associated with increased time taken to conceive (Bolumar et al 1997; Wilcox et al 1988) and increased risk of spontaneous abortion (Cnattingius et al 2000), although not all studies have found an association (Hakim et al 1998). Less than half of the participants in this study thought that caffeine consumption was highly influential to the chance of conceiving, however most consumed only small quantities (one to two cups) of coffee per day.

Most participants ate a healthy diet, said they were physically fit and thought the connection between fertility and these factors was associated with general health and well being rather than a more specific connection. The benefits of a healthy diet and regular exercise are well known and this was reinforced by the responses of participants in this study. With regard to over the counter supplements, participants' belief and actions were disparate. Four couples said it was unnecessary to take additional supplements if eating a healthy diet, however all females and most males (eight) were taking some type of supplement. Various supplements were used, the most common being women's multi vitamins (six females). Three participants (two females and one male) were taking a mix of herbs put together by a naturopath and none knew the specific ingredients of theses mixtures. This is a similar finding to a recent South Australian survey of 97 new patients attending a clinic for fertility treatment, where 78% of those taking complementary medicines were using over-the-counter multi vitamins (Stankiewicz et al 2007). The use of Complementary medicine is widespread in America (Berman and Chesney 2005) and Australia (Xue et al 2007; MacLennan et al 2006) and this trend extends to the infertile population (Stankiewicz et al 2007). The popularity of supplements may be explained by the stress of continued infertility and the desire to take unproven and sometimes irrational measures. Further research is required regarding the reasons behind this practice. It is noteworthy that, given the effectiveness of reducing the risk of neural tube defects by taking a daily dose of folic acid (Wani 2000), only half of the females in this study were taking folic acid. Similar results were found in a recent Australian study of 588 pregnant women, where only 23% had taken folic acid prior to pregnancy (Forster et al 2009). This is well below the target that all women planning pregnancy should consume 0.4-0.5mg of folic acid per day for three months prior to pregnancy.

Limitations of this study include the small sample size and the well known difficulties with self reporting of behaviours such as alcohol consumption. The budget limited the opportunity to broaden the numbers of couples interviewed and the objective assessment of lifestyle factors such as alcohol consumption, diet and physical fitness.

While most males and females wanted to make lifestyle changes there were frequent barriers. In order to potentiate effective changes individuals should first be in an appropriate psychological

state of mind and have suitable resources and support available. Encouraging couples to utilise the counselling services that are readily available in fertility clinics may assist them in becoming psychologically prepared for change. The information from this study provides a sound basis for conducting a larger study conducting lifestyle interviews with couples seeking fertility treatment, to facilitate and support positive lifestyle changes.

CONCLUSION

This study has highlighted that infertile couples are generally aware of the potential impact of some lifestyle behaviours on fertility. In general participants were well informed about the risks associated with smoking and fertility and weight and fertility. What was not recognised or at least responded to was the major lifestyle risk factor of female obesity, with half of the obese women not considering their weight to be a risk factor to their own fertility. In light of the strength of the evidence relating to the impact of obesity on the chance of delivering a healthy baby, there is a need for community education and realignment of attitudes to support obesity management and prevention. There is also a need for counselling and appropriate resources to be included in the management plan for couples at fertility clinics. The other significant issue was stress and couples should be encouraged to be more forward in facing the problems and seeking assistance. The dangers of, recreational drugs and alcohol were well recognised and were not an issue in this cohort. The absence of folic acid is a specific addressable issue. There remains an obvious need to research and develop effective means of assisting couples to make 'healthier choices' that will improve their general health and well being and chances of conceiving an delivering a healthy child. Including an appropriate lifestyle assessment and counselling regarding appropriate changes should be part of a couples initial assessment at a fertility clinic.

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APPENDIX - INTERVIEW QUESTIONS

Section 1 – Factors affecting the chance of pregnancy and the health of a pregnancy		
Smoking		
Can smoking affect the chance of becoming pregnant? Y/N		How?
Can smoking affect the health of a pregnancy? Y/N		How?
What about in your case? - give reasons		
Have you ever smoked cigarettes? Y/N	Do you smoke cigarettes now? Y/N	How many do you smoke a day?
Do you have any plans to stop?		
What if stopping increased your chance of becoming pregnant?		
What would help you to stop smoking?		
What prevents you from stopping smoking?		
Weight		
Can being over or underweight affect the chance or becoming pregnant? Y/N		
How?		
Can being over or underweight affect the health of a pregnancy? Y/N		
How?		
What about in your case? (Give reasons)		
Do you consider that you are over or underweight? Y/N (Over or under?)		
Do you have any plans to loose/gain weight?		
What if losing/gaining weight increased your chance of becoming pregnant?		
What would help you to lose/gain weight?		
What prevents you from losing/gaining weight?		

Section 2 – Factors that may influence chance of becoming pregnant		
Do the following influence the chance of becoming pregnant? *Rate from 1-10 (1= not very influential 10= highly influential)*		
Fitness		
Being physically fit – 1 2 3 4 5 6 7 8 9 10	Why?	How?
How often do you exercise and for how long?		Are you physically fit?
Diet		
Diet – 1 2 3 4 5 6 7 8 9 10	Why?	How?
Do you eat a healthy diet?	How often do you eat take away food? What type?	
Vitamin supplements		
OTC Vitamins – 1 2 3 4 5 6 7 8 9 10	Why?	How?
Are you taking any vitamin supplements?		
What are you taking and why?		
Other OTC		
Are you taking any other 'natural' medicines or supplements?		
What are you taking and why?		
Caffeine		
Caffeine – 1 2 3 4 5 6 7 8 9 10	Why?	How?
How much coffee/tea do you usually drink?		
Alcohol		
Alcohol – 1 2 3 4 5 6 7 8 9 10	Why?	How?
How much alcohol do you usually drink?		
Psychological stress		
Stress – 1 2 3 4 5 6 7 8 9 10	Why?	How?
Do you feel psychologically stressed?		
Recreational drugs		
Drugs – 1 2 3 4 5 6 7 8 9 10	Why?	How?
Do you take recreational drugs? - What? How often?		

Section 3 – Making lifestyle changes
Would you like to make any changes to your lifestyle?
If yes what would you like to change and why?
What would help you to make any change/changes?